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Correlation measures for bipolar rating profiles

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Abstract

© Springer International Publishing AG 2018. We introduce new correlation measures for measuring similarity and association of rating profiles obtained from bipolar rating scales. Instead of the measurement based approach when the user's rating is considered as a number measured in ordinal, interval or ratio scales we use model based approach when user's rating is modeled by bipolar score function that can be nonlinear. This approach can use different models of preferences for different users. The values of utility function can be adjusted in machine learning procedure to obtain better solutions on the output of recommender or decision making system. We show that Pearson's correlation coefficient often used for measuring similarity between bipolar rating profiles in recommender systems has some drawbacks. New correlation measures proposed in the paper have not these drawbacks. These measures are obtained using general methods of construction of association measures from similarity measures on sets with involutive operation. Proposed measures can be used in recommender systems, in opinion mining and in sociological research for analysis of possible relationships between opinions of users and ratings of items.

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Keywords

Association measure, Bipolar scale, Correlation, Opinion mining, Rating scale, Recommender system, Sentient analysis

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